

CLAIMS

1. A method of fabricating a monocrystalline or polycrystalline material over a substrate, comprising:
depositing a self-assembled monolayer (SAM) over the substrate;
depositing a layer over the SAM; and
substantially crystallizing the layer.
2. A method as recited in claim 1, wherein the step of substantially crystallizing the layer further comprises annealing the substrate.
3. A method as recited in claim 2, wherein the annealing is carried out at a temperature that is less than a strain point of the substrate.
4. A method as recited in claim 1, wherein the material is a semiconductor.
5. A method as recited in claim 4, wherein the semiconductor is chosen from the group consisting essentially of: silicon, germanium and silicon-germanium.
6. A method as recited in claim 4, wherein the substrate is an oxide of the semiconductor.
7. A method as recited in claim 1, wherein the layer is an oxide.
8. A method as recited in claim 1, wherein the SAM material comprises molecules, which have an order and spacing that substantially matches an order and spacing of a lattice of the material.
9. A method as recited in claim 1, wherein the step of crystallizing the layer forms the polycrystalline the material.

10. A method as recited in claim 1, wherein the step of crystallizing the layer forms the monocrystalline material.
11. A method as recited in claim 9, wherein the polycrystalline material is polycrystalline silicon.
12. A method as recited in claim 10, wherein the crystalline material is monocrystalline silicon.
13. A method as recited in claim 9, wherein the SAM layer is a compound of $R-(CH_2)_N-Si-R'_3$, and the R' groups are cleaved during the providing of the SAM layer over the substrate.
14. A method as recited in claim 10, wherein the SAM layer is a compound of $R-(CH_2)_N-Si-R'_3$, and the R' group are cleaved during the depositing of the SAM layer over the substrate.
15. A method as recited in claim 2, wherein the annealing of the substrate substantially pyrolyzes the SAM.
16. An apparatus, comprising:
a substrate having a monocrystalline or polycrystalline material disposed thereover, wherein the substrate has a strain point that is lower than a forming temperature of the polycrystalline or monocrystalline material.
17. An apparatus as recited in claim 16, wherein the apparatus is a display device.
18. An apparatus as recited in claim 16, wherein the material is a semiconductor.
19. An apparatus as recited in claim 17, wherein the display device is chosen from the group consisting of flat panel displays (FPD's) displays.

20. An apparatus as recited in claim 18, wherein the semiconductor is chosen from the group consisting essentially of: silicon, germanium and silicon-germanium.
21. An apparatus as recited in claim 18, wherein the carriers of the semiconductor material have a mobility in the range of approximately $50 \text{ cm}^2/\text{Vsec}$ to approximately $600 \text{ cm}^2/\text{Vsec}$.
22. An apparatus as recited in claim 18, wherein at least one electronic device is formed of the semiconductor.
22. An apparatus as recited in claim 21, wherein the mobility has a uniformity on the order of approximately $\pm 10\%$.
23. An apparatus as recited in claim 16, wherein grains of the material have a preferred orientation.
24. An apparatus as recited in claim 16, wherein the material is polycrystalline silicon having grain sizes of approximately $1 \text{ }\mu\text{m}$ to approximately $2 \text{ }\mu\text{m}$.